

STARK BROADENING PARAMETER TABLES FOR S V

M. S. Dimitrijević¹ and S. Sahal–Bréchet²

¹ *Astronomical Observatory, Volgina 7, 11000 Belgrade, Yugoslavia*

² *Laboratoire "Astrophysique, Atomes et Molécules"
Département Atomes et Molécules en Astrophysique
Unité associée au C.N.R.S. No 812
Observatoire de Paris–Meudon, 92190 Meudon, France*

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SUMMARY: Using a semiclassical approach, we have calculated electron–, proton–, and He III–impact line widths and shifts for 34 S V multiplets as a function of temperature and perturber density.

1. INTRODUCTION

Recently, S V spectral lines have been observed in spectra of some sdO stars (Rauch, 1996). Consequently, data on the shape of S V spectral lines are of interest for the modelling and interpretation of astrophysical spectra. As the continuation of our effort to provide to astrophysicists and plasma physicists Stark broadening data needed for the investigations of astrophysical and laboratory plasmas as well as plasmas in various plasma devices in technology, we have calculated within the semiclassical-perturbation formalism (Sahal–Bréchet, 1969ab, see also Sahal–Bréchet, 1974, Fleurier et al, 1977, Dimitrijević and Sahal–Bréchet, 1984, Dimitrijević et al. 1991, Dimitrijević and Sahal–Bréchet, 1995) electron-, proton-, and He III-impact line widths and shifts for 34 S V multiplets. A summary of the formalism is given in Dimitrijević and Sahal–Bréchet, 1995.

2. RESULTS AND DISCUSSION

The analysis of obtained results, and all relevant details concerning calculations and the comparison with other theoretical data will be appear in Dimitrijević and Sahal–Bréchet, 1997. Here, we present only tables of Stark broadening parameters. Atomic energy levels needed for calculations have been taken from Martin, Zalubas and Musgrove (1990). Our results for 34 S V multiplets are shown in Table 1, for perturber densities $10^{17} - 10^{21} \text{ cm}^{-3}$ and temperatures $T = 20,000 - 1,000,000 \text{ K}$. The complete set of data is for the electron density of 10^{18} cm^{-3} and for 10^{17} cm^{-3} only data needed for more accurate interpolation are given. We also specify a parameter c (Dimitrijević and Sahal–Bréchet 1984), which gives an estimate of the maximum perturber density for which the line may be treated as isolated when it is divided by the corresponding full width

Table 1. This table shows electron-, proton-, and He III-impact broadening parameters for S V, for perturber densities of 10^{17} – 10^{21} cm^{-3} and temperatures from 20,000 up to 1,000,000 K. The complete set of data is for the electron density of 10^{18} cm^{-3} and for 10^{17} cm^{-3} only data needed for more accurate interpolation are given. Stark broadening parameters for densities lower than tabulated, are linear with perturber density. Transitions and averaged wavelengths for the multiplet (in Å) are also given in the table. By dividing c by the corresponding full width at half maximum (Dimitrijević *et al.*, 1991), we obtain an estimate for the maximum perturber density for which the line may be treated as isolated and tabulated data may be used. The asterisk identifies cases for which the collision volume multiplied by the perturber density (the condition for validity of the impact approximation) lies between 0.1 and 0.5.

PERTURBER DENSITY = 1.E+17cm-3							
PERTURBERS ARE:		ELECTRONS		PROTONS		He III	
TRANSITION	T(K)	WIDTH(Å)	SHIFT(Å)	WIDTH(Å)	SHIFT(Å)	WIDTH(Å)	SHIFT(Å)
S V 5S 5P 5839.7 Å C= 0.58E+21	20000.	1.70	-0.325E-01	0.420E-01	-0.166E-01	0.810E-01	-0.304E-01
	50000.	1.20	-0.383E-01	0.782E-01	-0.338E-01	0.154	-0.658E-01
	100000.	0.968	-0.523E-01	0.102	-0.471E-01	0.204	-0.940E-01
	150000.	0.866	-0.494E-01	0.112	-0.528E-01	0.224	-0.107
	300000.	0.732	-0.469E-01	0.128	-0.636E-01	0.255	-0.129
	500000.	0.654	-0.447E-01	0.140	-0.728E-01	0.279	-0.147
S V 3P 4S 518.2 Å C= 0.79E+19	20000.	0.391E-02	0.371E-04	0.588E-05	0.372E-04	0.113E-04	0.682E-04
	50000.	0.237E-02	0.160E-03	0.368E-04	0.874E-04	0.725E-04	0.171E-03
	100000.	0.174E-02	0.155E-03	0.889E-04	0.132E-03	0.178E-03	0.264E-03
	150000.	0.148E-02	0.177E-03	0.122E-03	0.161E-03	0.243E-03	0.325E-03
	300000.	0.116E-02	0.173E-03	0.190E-03	0.201E-03	0.382E-03	0.405E-03
	500000.	0.985E-03	0.164E-03	0.232E-03	0.229E-03	0.468E-03	0.463E-03
S V 3P 5S 329.3 Å C= 0.19E+19	20000.	0.316E-02	0.244E-03	0.191E-04	0.705E-04	0.374E-04	0.129E-03
	50000.	0.198E-02	0.250E-03	0.838E-04	0.136E-03	0.168E-03	0.264E-03
	100000.	0.150E-02	0.275E-03	0.151E-03	0.189E-03	0.302E-03	0.377E-03
	150000.	0.130E-02	0.275E-03	0.189E-03	0.210E-03	0.383E-03	0.424E-03
	300000.	0.105E-02	0.253E-03	0.251E-03	0.253E-03	0.500E-03	0.511E-03
	500000.	0.905E-03	0.238E-03	0.296E-03	0.284E-03	0.604E-03	0.578E-03
S V 3P 6S 279.1 Å C= 0.57E+18	20000.	0.467E-02	0.863E-03	0.125E-03	0.224E-03	0.248E-03	0.401E-03
	50000.	0.341E-02	0.658E-03	0.300E-03	0.372E-03	0.600E-03	0.711E-03
	100000.	0.278E-02	0.627E-03	0.431E-03	0.457E-03	0.865E-03	0.899E-03
	150000.	0.247E-02	0.597E-03	0.501E-03	0.508E-03	0.100E-02	0.102E-02
	300000.	0.202E-02	0.547E-03	0.621E-03	0.594E-03	0.128E-02	0.120E-02
	500000.	0.177E-02	0.492E-03	0.721E-03	0.649E-03	0.146E-02	0.132E-02
S V 4P 5S 1230.5 Å C= 0.26E+20	20000.	0.564E-01	0.302E-02	0.462E-03	0.968E-03	0.895E-03	0.177E-02
	50000.	0.370E-01	0.309E-02	0.145E-02	0.187E-02	0.289E-02	0.364E-02
	100000.	0.283E-01	0.357E-02	0.244E-02	0.260E-02	0.488E-02	0.520E-02
	150000.	0.246E-01	0.360E-02	0.293E-02	0.289E-02	0.587E-02	0.584E-02
	300000.	0.201E-01	0.325E-02	0.376E-02	0.349E-02	0.749E-02	0.702E-02
	500000.	0.175E-01	0.309E-02	0.439E-02	0.391E-02	0.891E-02	0.799E-02
S V 4P 6S 736.1 Å C= 0.40E+19	20000.	0.368E-01	0.478E-02	0.906E-03	0.155E-02	0.180E-02	0.278E-02
	50000.	0.267E-01	0.439E-02	0.213E-02	0.258E-02	0.426E-02	0.494E-02
	100000.	0.217E-01	0.422E-02	0.303E-02	0.317E-02	0.608E-02	0.624E-02
	150000.	0.194E-01	0.404E-02	0.351E-02	0.353E-02	0.703E-02	0.709E-02
	300000.	0.160E-01	0.369E-02	0.434E-02	0.411E-02	0.892E-02	0.830E-02
	500000.	0.140E-01	0.333E-02	0.503E-02	0.451E-02	0.102E-01	0.915E-02
S V 5P 6S 2669.5 Å C= 0.52E+20	20000.	0.557	0.500E-01	0.159E-01	0.197E-01	0.312E-01	0.353E-01
	50000.	0.419	0.485E-01	0.324E-01	0.328E-01	0.645E-01	0.628E-01
	100000.	0.349	0.482E-01	0.429E-01	0.402E-01	0.866E-01	0.793E-01
	150000.	0.316	0.457E-01	0.488E-01	0.447E-01	0.990E-01	0.902E-01
	300000.	0.267	0.428E-01	0.607E-01	0.523E-01	0.124	0.106
	500000.	0.237	0.385E-01	0.690E-01	0.576E-01	0.137	0.117
S V 3P 5D 291.5 Å C= 0.47E+18	20000.	0.408E-02	0.162E-03	0.140E-03	0.118E-03	0.271E-03	0.214E-03
	50000.	0.305E-02	0.218E-03	0.270E-03	0.212E-03	0.535E-03	0.408E-03
	100000.	0.247E-02	0.209E-03	0.358E-03	0.270E-03	0.716E-03	0.537E-03
	150000.	0.219E-02	0.204E-03	0.404E-03	0.303E-03	0.807E-03	0.614E-03
	300000.	0.182E-02	0.197E-03	0.490E-03	0.362E-03	0.966E-03	0.730E-03
	500000.	0.160E-02	0.171E-03	0.542E-03	0.399E-03	0.107E-02	0.806E-03

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PERTURBERS ARE: TRANSITION		T(K)	ELECTRONS WIDTH(Å) SHIFT(Å)	PROTONS WIDTH(Å) SHIFT(Å)	He III WIDTH(Å) SHIFT(Å)
S V 3P 6D 264.8 Å C= 0.38E+18	20000.	0.569E-02	0.474E-03	0.341E-03	0.223E-03
	50000.	0.461E-02	0.526E-03	0.545E-03	0.366E-03
	100000.	0.399E-02	0.487E-03	0.654E-03	0.449E-03
	150000.	0.366E-02	0.477E-03	0.720E-03	0.496E-03
	300000.	0.317E-02	0.444E-03	0.834E-03	0.583E-03
	500000.	0.286E-02	0.387E-03	0.924E-03	0.655E-03
S V 4P 4D 2080.3 Å C= 0.88E+20	20000.	0.123	0.142E-02	0.179E-02	0.520E-03
	50000.	0.814E-01	0.115E-02	0.409E-02	0.124E-02
	100000.	0.614E-01	0.165E-02	0.585E-02	0.191E-02
	150000.	0.531E-01	0.166E-02	0.662E-02	0.232E-02
	300000.	0.427E-01	0.128E-02	0.758E-02	0.291E-02
	500000.	0.373E-01	0.125E-02	0.832E-02	0.333E-02
S V 4P 5D 828.5 Å C= 0.38E+19	20000.	0.376E-01	0.141E-02	0.123E-02	0.949E-03
	50000.	0.277E-01	0.168E-02	0.231E-02	0.170E-02
	100000.	0.223E-01	0.162E-02	0.301E-02	0.217E-02
	150000.	0.198E-01	0.158E-02	0.338E-02	0.244E-02
	300000.	0.164E-01	0.149E-02	0.407E-02	0.291E-02
	500000.	0.145E-01	0.129E-02	0.448E-02	0.320E-02
S V 4P 6D 644.2 Å C= 0.22E+19	20000.	0.363E-01	0.271E-02	0.207E-02	0.132E-02
	50000.	0.290E-01	0.301E-02	0.328E-02	0.216E-02
	100000.	0.249E-01	0.280E-02	0.393E-02	0.265E-02
	150000.	0.229E-01	0.276E-02	0.432E-02	0.293E-02
	300000.	0.198E-01	0.255E-02	0.499E-02	0.344E-02
	500000.	0.178E-01	0.223E-02	0.551E-02	0.387E-02
S V 5P 5D 4483.6 Å C= 0.11E+21	20000.	1.30	0.294E-01	0.522E-01	0.252E-01
	50000.	0.983	0.351E-01	0.882E-01	0.457E-01
	100000.	0.809	0.329E-01	0.107	0.588E-01
	150000.	0.728	0.289E-01	0.117	0.659E-01
	300000.	0.615	0.287E-01	0.136	0.783E-01
	500000.	0.549	0.234E-01	0.149	0.880E-01
S V 5P 6D 1759.5 Å C= 0.17E+20	20000.	0.295	0.167E-01	0.171E-01	0.951E-02
	50000.	0.238	0.195E-01	0.263E-01	0.157E-01
	100000.	0.207	0.182E-01	0.312E-01	0.192E-01
	150000.	0.191	0.177E-01	0.342E-01	0.213E-01
	300000.	0.166	0.166E-01	0.386E-01	0.250E-01
	500000.	0.150	0.143E-01	0.425E-01	0.281E-01
S V 3D 4P 1268.5 Å C= 0.47E+20	20000.	0.300E-01	-0.243E-03	0.329E-03	0.158E-04
	50000.	0.195E-01	0.161E-03	0.845E-03	0.422E-04
	100000.	0.144E-01	0.128E-03	0.127E-02	0.809E-04
	150000.	0.123E-01	0.149E-03	0.153E-02	0.110E-03
	300000.	0.969E-02	0.220E-03	0.176E-02	0.163E-03
	500000.	0.835E-02	0.192E-03	0.192E-02	0.208E-03
S V 3D 5P 564.3 Å C= 0.55E+19	20000.	0.108E-01	0.185E-03	0.397E-03	0.581E-04
	50000.	0.768E-02	0.274E-03	0.723E-03	0.133E-03
	100000.	0.614E-02	0.266E-03	0.929E-03	0.196E-03
	150000.	0.546E-02	0.308E-03	0.100E-02	0.238E-03
	300000.	0.458E-02	0.282E-03	0.113E-02	0.289E-03
	500000.	0.409E-02	0.267E-03	0.120E-02	0.330E-03
S V 4D 5P 1987.3 Å C= 0.68E+20	20000.	0.166	0.102E-02	0.453E-02	0.548E-03
	50000.	0.117	0.721E-03	0.834E-02	0.129E-02
	100000.	0.934E-01	0.143E-02	0.109E-01	0.195E-02
	150000.	0.831E-01	0.114E-02	0.117E-01	0.238E-02
	300000.	0.696E-01	0.103E-02	0.131E-01	0.296E-02
	500000.	0.620E-01	0.972E-03	0.140E-01	0.337E-02
S V 3D 4F 679.0 Å C= 0.94E+19	20000.	0.896E-02	-0.184E-03	0.963E-04	-0.238E-04
	50000.	0.583E-02	-0.101E-04	0.248E-03	-0.607E-04
	100000.	0.433E-02	-0.410E-04	0.374E-03	-0.103E-03
	150000.	0.370E-02	-0.458E-04	0.450E-03	-0.125E-03
	300000.	0.294E-02	0.344E-05	0.522E-03	-0.171E-03
	500000.	0.255E-02	-0.765E-05	0.572E-03	-0.194E-03

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS WIDTH(Å)	SHIFT(Å)	PROTONS WIDTH(Å)	SHIFT(Å)	He III WIDTH(Å)	SHIFT(Å)
S V 4D 4F 4906.8 Å C= 0.49E+21	20000.	0.706	-0.141E-01	0.101E-01	-0.433E-02	0.193E-01	-0.794E-02
	50000.	0.466	-0.942E-02	0.233E-01	-0.990E-02	0.458E-01	-0.193E-01
	100000.	0.352	-0.133E-01	0.334E-01	-0.146E-01	0.662E-01	-0.292E-01
	150000.	0.304	-0.138E-01	0.380E-01	-0.178E-01	0.759E-01	-0.359E-01
	300000.	0.246	-0.102E-01	0.442E-01	-0.216E-01	0.880E-01	-0.439E-01
	500000.	0.215	-0.102E-01	0.491E-01	-0.247E-01	0.969E-01	-0.500E-01
S V 4F 5D 1914.1 Å C= 0.20E+20	20000.	0.204	0.852E-02	0.661E-02	0.523E-02	0.128E-01	0.948E-02
	50000.	0.150	0.947E-02	0.125E-01	0.933E-02	0.247E-01	0.180E-01
	100000.	0.120	0.929E-02	0.163E-01	0.119E-01	0.325E-01	0.236E-01
	150000.	0.107	0.913E-02	0.182E-01	0.133E-01	0.365E-01	0.270E-01
	300000.	0.888E-01	0.841E-02	0.218E-01	0.158E-01	0.436E-01	0.322E-01
	500000.	0.784E-01	0.739E-02	0.242E-01	0.176E-01	0.475E-01	0.354E-01
S V 4F 6D 1152.4 Å C= 0.72E+19	20000.	0.117	0.914E-02	0.662E-02	0.426E-02	*0.129E-01	*0.759E-02
	50000.	0.936E-01	0.988E-02	0.105E-01	0.699E-02	*0.210E-01	*0.133E-01
	100000.	0.804E-01	0.923E-02	0.126E-01	0.856E-02	*0.252E-01	*0.169E-01
	150000.	0.737E-01	0.910E-02	0.139E-01	0.945E-02	*0.279E-01	*0.192E-01
	300000.	0.638E-01	0.835E-02	0.160E-01	0.111E-01	*0.320E-01	*0.225E-01
	500000.	0.574E-01	0.731E-02	0.179E-01	0.125E-01	0.351E-01	0.254E-01
S V 4F 5G 1770.2 Å C= 0.42E+19	20000.	0.119	0.649E-02	0.368E-02	0.702E-02	0.724E-02	0.126E-01
	50000.	0.826E-01	0.671E-02	0.939E-02	0.119E-01	0.186E-01	0.228E-01
	100000.	0.646E-01	0.679E-02	0.146E-01	0.147E-01	0.285E-01	0.292E-01
	150000.	0.568E-01	0.706E-02	0.173E-01	0.163E-01	0.329E-01	0.330E-01
	300000.	0.467E-01	0.578E-02	0.231E-01	0.193E-01	0.420E-01	0.393E-01
	500000.	0.408E-01	0.523E-02	0.278E-01	0.215E-01	0.479E-01	0.432E-01
S V 4F 6G 1108.2 Å C= 0.11E+19	20000.	0.118	0.116E-01	0.803E-02	0.103E-01	*0.160E-01	*0.176E-01
	50000.	0.856E-01	0.116E-01	0.153E-01	0.156E-01	*0.303E-01	*0.291E-01
	100000.	0.688E-01	0.116E-01	0.197E-01	0.193E-01	*0.390E-01	*0.374E-01
	150000.	0.610E-01	0.112E-01	0.234E-01	0.211E-01	*0.449E-01	*0.430E-01
	300000.	0.500E-01	0.938E-02	0.291E-01	0.247E-01	*0.532E-01	*0.499E-01
	500000.	0.431E-01	0.804E-02	0.353E-01	0.266E-01	*0.636E-01	*0.547E-01
S V 3D 4F 568.3 Å C= 0.48E+19	20000.	0.580E-02	-0.157E-03	0.533E-04	-0.271E-04	0.102E-03	-0.498E-04
	50000.	0.377E-02	-0.310E-04	0.145E-03	-0.672E-04	0.283E-03	-0.131E-03
	100000.	0.279E-02	-0.290E-04	0.227E-03	-0.108E-03	0.447E-03	-0.216E-03
	150000.	0.238E-02	-0.345E-04	0.279E-03	-0.131E-03	0.553E-03	-0.263E-03
	300000.	0.187E-02	-0.387E-05	0.337E-03	-0.168E-03	0.669E-03	-0.340E-03
	500000.	0.161E-02	-0.106E-04	0.377E-03	-0.193E-03	0.744E-03	-0.391E-03
S V 4D 4F 6726.1 Å C= 0.67E+21	20000.	1.31	-0.322E-01	0.174E-01	-0.111E-01	0.334E-01	-0.204E-01
	50000.	0.871	-0.222E-01	0.418E-01	-0.248E-01	0.823E-01	-0.483E-01
	100000.	0.658	-0.280E-01	0.614E-01	-0.359E-01	0.122	-0.716E-01
	150000.	0.569	-0.271E-01	0.711E-01	-0.425E-01	0.142	-0.861E-01
	300000.	0.457	-0.220E-01	0.844E-01	-0.512E-01	0.168	-0.103
	500000.	0.398	-0.221E-01	0.956E-01	-0.580E-01	0.188	-0.118
S V 4F 5D 1748.8 Å C= 0.18E+20	20000.	0.163	0.727E-02	0.514E-02	0.420E-02	0.995E-02	0.762E-02
	50000.	0.121	0.801E-02	0.984E-02	0.753E-02	0.195E-01	0.145E-01
	100000.	0.970E-01	0.781E-02	0.130E-01	0.962E-02	0.259E-01	0.191E-01
	150000.	0.862E-01	0.770E-02	0.146E-01	0.108E-01	0.292E-01	0.218E-01
	300000.	0.715E-01	0.717E-02	0.176E-01	0.129E-01	0.348E-01	0.259E-01
	500000.	0.631E-01	0.637E-02	0.195E-01	0.142E-01	0.387E-01	0.288E-01
S V 4F 6D 1070.8 Å C= 0.47E+19	20000.	0.105	0.587E-02	0.578E-02	0.409E-02	*0.113E-01	*0.728E-02
	50000.	0.808E-01	0.761E-02	0.934E-02	0.664E-02	*0.187E-01	*0.127E-01
	100000.	0.671E-01	0.685E-02	0.114E-01	0.814E-02	*0.226E-01	*0.160E-01
	150000.	0.605E-01	0.678E-02	0.126E-01	0.903E-02	*0.251E-01	*0.182E-01
	300000.	0.512E-01	0.617E-02	0.148E-01	0.106E-01	*0.293E-01	*0.215E-01
	500000.	0.456E-01	0.520E-02	0.162E-01	0.114E-01	0.326E-01	0.236E-01
PERTURBER DENSITY = 1.E+18cm-3							
S V 3S 3P 786.5 Å C= 0.79E+21	20000.	0.407E-01	0.424E-04	0.660E-04	-0.157E-04	0.113E-03	-0.229E-04
	50000.	0.261E-01	-0.133E-03	0.249E-03	-0.481E-04	0.477E-03	-0.897E-04
	100000.	0.186E-01	-0.185E-03	0.550E-03	-0.100E-03	0.107E-02	-0.195E-03
	150000.	0.153E-01	-0.168E-03	0.774E-03	-0.146E-03	0.151E-02	-0.291E-03
	300000.	0.114E-01	-0.204E-03	0.114E-02	-0.248E-03	0.225E-02	-0.498E-03
	500000.	0.941E-02	-0.205E-03	0.138E-02	-0.319E-03	0.274E-02	-0.644E-03

STARK BROADENING PARAMETER TABLES FOR S V

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS WIDTH(Å)	SHIFT(Å)	PROTONS WIDTH(Å)	SHIFT(Å)	He III WIDTH(Å)	SHIFT(Å)
S V 3S 4P 286.1 Å C= 0.24E+20	20000.	0.147E-01	-0.176E-03	0.138E-03	0.636E-05	0.234E-03	0.929E-05
	50000.	0.950E-02	0.737E-04	0.373E-03	0.194E-04	0.720E-03	0.362E-04
	100000.	0.700E-02	0.546E-04	0.572E-03	0.390E-04	0.113E-02	0.759E-04
	150000.	0.595E-02	0.622E-04	0.694E-03	0.536E-04	0.137E-02	0.107E-03
	300000.	0.467E-02	0.102E-03	0.810E-03	0.802E-04	0.161E-02	0.162E-03
	500000.	0.401E-02	0.843E-04	0.882E-03	0.102E-03	0.175E-02	0.207E-03
S V 3S 5P 223.3 Å C= 0.85E+19	20000.	0.167E-01	0.232E-03	0.579E-03	0.750E-04	*0.952E-03	*0.109E-03
	50000.	0.119E-01	0.411E-03	0.109E-02	0.194E-03	*0.211E-02	*0.358E-03
	100000.	0.947E-02	0.397E-03	0.142E-02	0.301E-03	*0.281E-02	*0.579E-03
	150000.	0.843E-02	0.468E-03	0.154E-02	0.367E-03	*0.305E-02	*0.732E-03
	300000.	0.706E-02	0.431E-03	0.172E-02	0.451E-03	*0.344E-02	*0.915E-03
	500000.	0.630E-02	0.410E-03	0.183E-02	0.515E-03	*0.365E-02	*0.104E-02
S V 4S 4P 3398.3 Å C= 0.34E+22	20000.	2.84	-0.228E-01	0.201E-01	-0.121E-01	0.344E-01	-0.176E-01
	50000.	1.83	-0.514E-01	0.563E-01	-0.325E-01	0.109	-0.602E-01
	100000.	1.37	-0.528E-01	0.887E-01	-0.520E-01	0.175	-0.101
	150000.	1.17	-0.627E-01	0.110	-0.636E-01	0.219	-0.127
	300000.	0.935	-0.551E-01	0.133	-0.803E-01	0.266	-0.162
	500000.	0.809	-0.543E-01	0.150	-0.918E-01	0.299	-0.186
S V 4S 5P 782.4 Å C= 0.10E+21	20000.	0.242	0.215E-02	0.708E-02	0.245E-03	*0.116E-01	*0.357E-03
	50000.	0.170	0.145E-02	0.133E-01	0.713E-03	*0.257E-01	*0.133E-02
	100000.	0.135	0.149E-02	0.173E-01	0.127E-02	*0.342E-01	*0.247E-02
	150000.	0.120	0.186E-02	0.187E-01	0.157E-02	*0.371E-01	*0.313E-02
	300000.	0.101	0.154E-02	0.209E-01	0.216E-02	*0.416E-01	*0.436E-02
	500000.	0.900E-01	0.149E-02	0.221E-01	0.247E-02	*0.442E-01	*0.500E-02
S V 5S 5P 5839.7 Å C= 0.58E+22	20000.	17.0	-0.283	0.405	-0.136	*0.669	-0.194
	50000.	12.0	-0.355	0.777	-0.312	*1.50	-0.569
	100000.	9.68	-0.506	1.02	-0.460	*2.02	-0.877
	150000.	8.66	-0.480	1.12	-0.519	*2.23	-1.03
	300000.	7.32	-0.463	1.28	-0.634	*2.55	-1.29
	500000.	6.54	-0.446	1.40	-0.726	*2.79	-1.46
S V 3P 4S 518.2 Å C= 0.79E+20	20000.	0.385E-01	0.202E-03	0.580E-04	0.307E-03	0.105E-03	0.448E-03
	50000.	0.237E-01	0.155E-02	0.368E-03	0.819E-03	0.724E-03	0.152E-02
	100000.	0.174E-01	0.152E-02	0.889E-03	0.130E-02	0.178E-02	0.251E-02
	150000.	0.148E-01	0.176E-02	0.122E-02	0.159E-02	0.243E-02	0.317E-02
	300000.	0.116E-01	0.172E-02	0.190E-02	0.200E-02	0.382E-02	0.404E-02
	500000.	0.985E-02	0.163E-02	0.232E-02	0.228E-02	0.468E-02	0.462E-02
S V 3P 5S 329.3 Å C= 0.19E+20	20000.	0.312E-01	0.225E-02	0.191E-03	0.575E-03	*0.366E-03	*0.812E-03
	50000.	0.198E-01	0.239E-02	0.837E-03	0.125E-02	0.167E-02	0.226E-02
	100000.	0.150E-01	0.268E-02	0.151E-02	0.184E-02	0.302E-02	0.350E-02
	150000.	0.130E-01	0.269E-02	0.189E-02	0.206E-02	0.383E-02	0.409E-02
	300000.	0.105E-01	0.250E-02	0.251E-02	0.252E-02	0.500E-02	0.509E-02
	500000.	0.905E-02	0.237E-02	0.296E-02	0.284E-02	0.604E-02	0.575E-02
S V 3P 6S 279.1 Å C= 0.57E+19	20000.	0.467E-01	0.796E-02	*0.125E-02	*0.172E-02		
	50000.	0.341E-01	0.615E-02	*0.300E-02	*0.327E-02		
	100000.	0.278E-01	0.597E-02	0.431E-02	0.438E-02		
	150000.	0.247E-01	0.571E-02	0.502E-02	0.492E-02		
	300000.	0.202E-01	0.536E-02	0.621E-02	0.591E-02		
	500000.	0.177E-01	0.491E-02	0.720E-02	0.646E-02		
S V 4P 5S 1230.5 Å C= 0.26E+21	20000.	0.563	0.276E-01	0.455E-02	0.789E-02	*0.821E-02	*0.112E-01
	50000.	0.370	0.294E-01	0.144E-01	0.172E-01	*0.286E-01	*0.311E-01
	100000.	0.283	0.346E-01	0.244E-01	0.254E-01	*0.488E-01	*0.482E-01
	150000.	0.246	0.352E-01	0.293E-01	0.284E-01	0.587E-01	0.563E-01
	300000.	0.201	0.322E-01	0.376E-01	0.348E-01	0.749E-01	0.700E-01
	500000.	0.175	0.308E-01	0.439E-01	0.390E-01	0.891E-01	0.795E-01
S V 4P 6S 736.1 Å C= 0.40E+20	20000.	0.368	0.431E-01	*0.903E-02	*0.119E-01		
	50000.	0.267	0.409E-01	*0.213E-01	*0.227E-01		
	100000.	0.217	0.401E-01	0.303E-01	0.304E-01		
	150000.	0.194	0.386E-01	0.352E-01	0.342E-01		
	300000.	0.160	0.362E-01	0.434E-01	0.409E-01		
	500000.	0.140	0.332E-01	0.503E-01	0.449E-01		

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS WIDTH(Å)	SHIFT(Å)	PROTONS WIDTH(Å)	SHIFT(Å)	He III WIDTH(Å)	SHIFT(Å)
S V 5P 6S 2669.5 Å C= 0.52E+21	20000.	5.57	0.442	*0.155	*0.151		
	50000.	4.19	0.447	*0.322	*0.289		
	100000.	3.49	0.456	*0.428	*0.385		
	150000.	3.16	0.434	0.488	0.433		
	300000.	2.67	0.418	0.607	0.521		
	500000.	2.37	0.383	0.689	0.574		
S V 3P 3D 696.6 Å C= 0.38E+21	20000.	0.406E-01	-0.268E-03	0.159E-03	0.106E-04	0.272E-03	0.155E-04
	50000.	0.264E-01	0.599E-04	0.547E-03	0.325E-04	0.105E-02	0.606E-04
	100000.	0.190E-01	0.857E-04	0.105E-02	0.680E-04	0.204E-02	0.132E-03
	150000.	0.158E-01	0.666E-04	0.134E-02	0.995E-04	0.264E-02	0.198E-03
	300000.	0.119E-01	0.101E-03	0.183E-02	0.170E-03	0.363E-02	0.342E-03
	500000.	0.994E-02	0.831E-04	0.203E-02	0.223E-03	0.403E-02	0.449E-03
S V 3P 4D 369.7 Å C= 0.28E+20	20000.	0.283E-01	0.120E-03	0.320E-03	0.150E-03	0.545E-03	0.218E-03
	50000.	0.185E-01	0.492E-03	0.844E-03	0.401E-03	0.163E-02	0.743E-03
	100000.	0.139E-01	0.636E-03	0.128E-02	0.638E-03	0.253E-02	0.123E-02
	150000.	0.119E-01	0.654E-03	0.154E-02	0.782E-03	0.306E-02	0.156E-02
	300000.	0.950E-02	0.614E-03	0.181E-02	0.984E-03	0.362E-02	0.199E-02
	500000.	0.821E-02	0.580E-03	0.203E-02	0.113E-02	0.406E-02	0.227E-02
S V 3P 5D 291.5 Å C= 0.47E+19	20000.	0.408E-01	0.128E-02	0.135E-02	0.940E-03		
	50000.	0.305E-01	0.198E-02	0.268E-02	0.191E-02		
	100000.	0.247E-01	0.196E-02	0.357E-02	0.261E-02		
	150000.	0.219E-01	0.192E-02	0.404E-02	0.296E-02	*0.805E-02	*0.585E-02
	300000.	0.182E-01	0.192E-02	0.490E-02	0.361E-02	*0.965E-02	*0.727E-02
	500000.	0.160E-01	0.171E-02	0.542E-02	0.397E-02	*0.107E-01	*0.801E-02
S V 3P 6D 264.8 Å C= 0.38E+19	20000.	0.569E-01	0.404E-02	*0.323E-02	*0.169E-02		
	50000.	0.461E-01	0.482E-02	*0.540E-02	*0.320E-02		
	100000.	0.399E-01	0.457E-02	*0.653E-02	*0.430E-02		
	150000.	0.366E-01	0.451E-02	*0.719E-02	*0.480E-02		
	300000.	0.317E-01	0.432E-02	*0.834E-02	*0.580E-02		
	500000.	0.286E-01	0.385E-02	*0.924E-02	*0.653E-02		
S V 4P 4D 2080.3 Å C= 0.88E+21	20000.	1.23	0.129E-01	0.174E-01	0.430E-02	0.293E-01	0.627E-02
	50000.	0.814	0.106E-01	0.408E-01	0.117E-01	0.791E-01	0.216E-01
	100000.	0.614	0.159E-01	0.584E-01	0.188E-01	0.115	0.363E-01
	150000.	0.531	0.162E-01	0.661E-01	0.229E-01	0.132	0.458E-01
	300000.	0.427	0.126E-01	0.758E-01	0.290E-01	0.151	0.586E-01
	500000.	0.373	0.125E-01	0.832E-01	0.332E-01	0.165	0.672E-01
S V 4P 5D 828.5 Å C= 0.38E+20	20000.	0.376	0.115E-01	0.119E-01	0.755E-02		
	50000.	0.277	0.152E-01	0.230E-01	0.153E-01		
	100000.	0.223	0.151E-01	0.301E-01	0.210E-01		
	150000.	0.198	0.148E-01	0.338E-01	0.238E-01	*0.673E-01	*0.470E-01
	300000.	0.164	0.144E-01	0.407E-01	0.290E-01	*0.802E-01	*0.583E-01
	500000.	0.145	0.128E-01	0.448E-01	0.320E-01	*0.885E-01	*0.645E-01
S V 4P 6D 644.2 Å C= 0.22E+20	20000.	0.363	0.230E-01	*0.196E-01	*0.100E-01		
	50000.	0.290	0.275E-01	*0.325E-01	*0.189E-01		
	100000.	0.249	0.262E-01	*0.392E-01	*0.254E-01		
	150000.	0.229	0.260E-01	*0.432E-01	*0.284E-01		
	300000.	0.198	0.248E-01	*0.499E-01	*0.343E-01		
	500000.	0.178	0.222E-01	*0.551E-01	*0.385E-01		
S V 5P 5D 4483.6 Å C= 0.11E+22	20000.	13.0	0.229	0.499	0.202		
	50000.	9.83	0.307	0.875	0.413		
	100000.	8.09	0.301	1.07	0.569		
	150000.	7.28	0.263	1.17	0.644		
	300000.	6.15	0.276	1.36	0.780	*2.70	*1.59
	500000.	5.49	0.232	1.49	0.878	*2.92	*1.77
S V 5P 6D 1759.5 Å C= 0.17E+21	20000.	2.95	0.137	*0.161	*0.724E-01		
	50000.	2.38	0.176	*0.259	*0.137		
	100000.	2.07	0.169	*0.311	*0.184		
	150000.	1.91	0.165	*0.341	*0.206		
	300000.	1.66	0.162	*0.386	*0.248		
	500000.	1.50	0.143	*0.425	*0.280		

STARK BROADENING PARAMETER TABLES FOR S V

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS WIDTH(Å)	SHIFT(Å)	PROTONS WIDTH(Å)	SHIFT(Å)	He III WIDTH(Å)	SHIFT(Å)
S V 3D 4P 1268.5 Å C= 0.47E+21	20000.	0.300	-0.272E-02	0.320E-02	0.131E-03	0.543E-02	0.191E-03
	50000.	0.195	0.160E-02	0.842E-02	0.399E-03	0.163E-01	0.744E-03
	100000.	0.144	0.127E-02	0.127E-01	0.799E-03	0.249E-01	0.156E-02
	150000.	0.123	0.144E-02	0.152E-01	0.110E-02	0.302E-01	0.218E-02
	300000.	0.969E-01	0.221E-02	0.176E-01	0.163E-02	0.351E-01	0.329E-02
	500000.	0.835E-01	0.191E-02	0.192E-01	0.208E-02	0.381E-01	0.420E-02
S V 3D 5P 564.3 Å C= 0.55E+20	20000.	0.108	0.164E-02	0.382E-02	0.480E-03	*0.627E-02	*0.698E-03
	50000.	0.768E-01	0.268E-02	0.718E-02	0.124E-02	*0.138E-01	*0.229E-02
	100000.	0.614E-01	0.259E-02	0.928E-02	0.192E-02	*0.184E-01	*0.370E-02
	150000.	0.546E-01	0.304E-02	0.100E-01	0.235E-02	*0.199E-01	*0.469E-02
	300000.	0.458E-01	0.280E-02	0.112E-01	0.289E-02	*0.224E-01	*0.585E-02
	500000.	0.409E-01	0.267E-02	0.120E-01	0.330E-02	*0.238E-01	*0.666E-02
S V 4D 5P 1987.3 Å C= 0.68E+21	20000.	1.66	0.916E-02	0.436E-01	0.454E-02	*0.718E-01	*0.661E-02
	50000.	1.17	0.620E-02	0.828E-01	0.121E-01	*0.160	*0.224E-01
	100000.	0.934	0.137E-01	0.108	0.191E-01	*0.214	*0.370E-01
	150000.	0.831	0.109E-01	0.117	0.235E-01	*0.233	*0.468E-01
	300000.	0.696	0.101E-01	0.131	0.295E-01	*0.262	*0.595E-01
	500000.	0.620	0.969E-02	0.140	0.337E-01	*0.278	*0.681E-01
S V 3D 4F 679.0 Å C= 0.94E+20	20000.	0.898E-01	-0.186E-02	0.936E-03	-0.197E-03	0.159E-02	-0.287E-03
	50000.	0.583E-01	-0.518E-04	0.247E-02	-0.572E-03	0.477E-02	-0.106E-02
	100000.	0.433E-01	-0.350E-03	0.373E-02	-0.101E-02	0.734E-02	-0.197E-02
	150000.	0.370E-01	-0.448E-03	0.449E-02	-0.124E-02	0.889E-02	-0.248E-02
	300000.	0.294E-01	0.505E-04	0.522E-02	-0.170E-02	0.104E-01	-0.345E-02
	500000.	0.255E-01	-0.752E-04	0.572E-02	-0.194E-02	0.114E-01	-0.394E-02
S V 4D 4F 4906.8 Å C= 0.49E+22	20000.	7.06	-0.130	0.979E-01	-0.358E-01	0.166	-0.520E-01
	50000.	4.66	-0.865E-01	0.232	-0.925E-01	0.450	-0.171
	100000.	3.52	-0.126	0.334	-0.144	0.660	-0.277
	150000.	3.04	-0.135	0.380	-0.176	0.758	-0.350
	300000.	2.46	-0.101	0.442	-0.216	0.880	-0.438
	500000.	2.15	-0.102	0.491	-0.247	0.969	-0.499
S V 4F 5D 1914.1 Å C= 0.20E+21	20000.	2.04	0.710E-01	0.638E-01	0.415E-01		
	50000.	1.50	0.855E-01	0.124	0.839E-01		
	100000.	1.20	0.865E-01	0.163	0.115		
	150000.	1.07	0.860E-01	0.182	0.130	*0.364	*0.257
	300000.	0.888	0.818E-01	0.218	0.158	*0.436	*0.320
	500000.	0.784	0.735E-01	0.242	0.175	*0.475	*0.352
S V 4F 6D 1152.4 Å C= 0.72E+20	20000.	1.17	0.780E-01	*0.627E-01	*0.323E-01		
	50000.	0.936	0.903E-01	*0.104	*0.611E-01		
	100000.	0.804	0.864E-01	*0.126	*0.820E-01		
	150000.	0.737	0.859E-01	*0.138	*0.915E-01		
	300000.	0.638	0.813E-01	*0.160	*0.111		
	500000.	0.574	0.727E-01	*0.179	*0.125		
S V 4F 5G 1770.2 Å C= 0.42E+20	20000.	1.43	0.428E-01	0.505E-01	0.547E-01		
	50000.	0.983	0.543E-01	0.112	0.105		
	100000.	0.765	0.582E-01	0.160	0.142		
	150000.	0.672	0.625E-01	0.188	0.159		
	300000.	0.550	0.544E-01	0.245	0.192		
	500000.	0.482	0.518E-01	0.292	0.214	*0.504	*0.429
S V 4F 6G 1108.2 Å C= 0.11E+20	20000.	*1.39	*0.686E-01				
	50000.	1.01	0.876E-01				
	100000.	0.812	0.948E-01				
	150000.	0.721	0.938E-01				
	300000.	0.594	0.862E-01	*0.303	*0.246		
	500000.	0.518	0.794E-01	*0.364	*0.265		
S V 3D 4F 568.3 Å C= 0.48E+20	20000.	0.581E-01	-0.157E-02	0.519E-03	-0.225E-03	0.884E-03	-0.328E-03
	50000.	0.377E-01	-0.262E-03	0.144E-02	-0.632E-03	0.279E-02	-0.117E-02
	100000.	0.279E-01	-0.256E-03	0.226E-02	-0.106E-02	0.446E-02	-0.206E-02
	150000.	0.238E-01	-0.334E-03	0.279E-02	-0.129E-02	0.553E-02	-0.258E-02
	300000.	0.187E-01	-0.244E-04	0.337E-02	-0.168E-02	0.669E-02	-0.339E-02
	500000.	0.161E-01	-0.104E-03	0.377E-02	-0.192E-02	0.744E-02	-0.391E-02

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS WIDTH(Å)	SHIFT(Å)	PROTONS WIDTH(Å)	SHIFT(Å)	He III WIDTH(Å)	SHIFT(Å)
S V 4D 4F 6726.1 Å C= 0.67E+22	20000.	13.1	-0.297	0.169	-0.919E-01	0.288	-0.133
	50000.	8.71	-0.202	0.416	-0.231	0.810	-0.426
	100000.	6.58	-0.267	0.613	-0.352	1.21	-0.676
	150000.	5.69	-0.263	0.710	-0.419	1.42	-0.838
	300000.	4.57	-0.215	0.844	-0.511	1.68	-1.03
	500000.	3.98	-0.220	0.956	-0.580	1.88	-1.18
S V 4F 5D 1748.8 Å C= 0.18E+21	20000.	1.63	0.614E-01	0.496E-01	0.334E-01		
	50000.	1.21	0.727E-01	0.977E-01	0.678E-01		
	100000.	0.970	0.731E-01	0.129	0.931E-01		
	150000.	0.862	0.728E-01	0.146	0.105	*0.291	*0.208
	300000.	0.715	0.698E-01	0.176	0.128	*0.348	*0.258
	500000.	0.631	0.634E-01	0.195	0.141	*0.387	*0.286
S V 4F 6D 1070.8 Å C= 0.47E+20	20000.	1.05	0.454E-01	*0.549E-01	*0.307E-01		
	50000.	0.807	0.679E-01	*0.922E-01	*0.575E-01		
	100000.	0.671	0.625E-01	*0.113	*0.777E-01		
	150000.	0.605	0.626E-01	*0.126	*0.873E-01		
	300000.	0.512	0.595E-01	*0.148	*0.105		
	500000.	0.456	0.517E-01	*0.162	*0.114		
PERTURBER DENSITY = 1.E+19							
S V 3S 3P 786.5 Å C= 0.79E+22	20000.	0.407	0.712E-03	0.523E-03	-0.850E-04	0.531E-03	-0.640E-04
	50000.	0.261	-0.123E-02	0.245E-02	-0.414E-03	0.441E-02	-0.654E-03
	100000.	0.186	-0.175E-02	0.548E-02	-0.942E-03	0.106E-01	-0.174E-02
	150000.	0.153	-0.165E-02	0.773E-02	-0.142E-02	0.151E-01	-0.270E-02
	300000.	0.114	-0.199E-02	0.114E-01	-0.246E-02	0.225E-01	-0.484E-02
	500000.	0.941E-01	-0.202E-02	0.138E-01	-0.319E-02	0.274E-01	-0.638E-02
S V 3S 4P 286.1 Å C= 0.24E+21	20000.	0.148	-0.214E-02	0.107E-02	0.345E-04	*0.100E-02	*0.260E-04
	50000.	0.950E-01	0.737E-03	0.362E-02	0.167E-03	*0.639E-02	*0.264E-03
	100000.	0.700E-01	0.530E-03	0.567E-02	0.365E-03	*0.109E-01	*0.673E-03
	150000.	0.595E-01	0.610E-03	0.691E-02	0.518E-03	*0.135E-01	*0.987E-03
	300000.	0.467E-01	0.100E-02	0.809E-02	0.793E-03	*0.160E-01	*0.156E-02
	500000.	0.401E-01	0.831E-03	0.882E-02	0.102E-02	*0.175E-01	*0.204E-02
S V 3S 5P 223.3 Å C= 0.85E+20	20000.	*0.167	*0.141E-02	*0.403E-02	*0.400E-03		
	50000.	0.119	0.373E-02	*0.103E-01	*0.161E-02		
	100000.	0.947E-01	0.370E-02	*0.139E-01	*0.271E-02		
	150000.	0.843E-01	0.442E-02	*0.152E-01	*0.346E-02		
	300000.	0.706E-01	0.412E-02	*0.172E-01	*0.441E-02		
	500000.	0.630E-01	0.396E-02	*0.183E-01	*0.514E-02		
S V 4S 4P 3398.3 Å C= 0.34E+23	20000.	*28.4	-0.869E-01	*0.157	-0.648E-01	*0.151	-0.475E-01
	50000.	18.3	-0.453	0.548	-0.273	*0.974	-0.414
	100000.	13.7	-0.484	0.881	-0.472	*1.70	-0.843
	150000.	11.7	-0.583	1.10	-0.603	*2.16	-1.11
	300000.	9.35	-0.522	1.33	-0.786	*2.65	-1.51
	500000.	8.09	-0.522	1.50	-0.916	*2.99	-1.80
S V 4S 5P 782.4 Å C= 0.10E+22	20000.	*2.42	*0.204E-01	*0.493E-01	*0.132E-02		
	50000.	1.70	0.132E-01	*0.126	*0.609E-02		
	100000.	1.35	0.140E-01	*0.170	*0.117E-01		
	150000.	1.20	0.179E-01	*0.185	*0.150E-01		
	300000.	1.01	0.148E-01	*0.208	*0.212E-01		
	500000.	0.900	0.145E-01	*0.221	*0.247E-01		
S V 3P 4S 518.2 Å C= 0.79E+21	20000.	0.385	-0.231E-02	0.513E-03	0.165E-02	*0.685E-03	*0.120E-02
	50000.	0.237	0.141E-01	0.366E-02	0.687E-02	*0.703E-02	*0.104E-01
	100000.	0.174	0.141E-01	0.886E-02	0.117E-01	*0.178E-01	*0.209E-01
	150000.	0.148	0.165E-01	0.122E-01	0.151E-01	*0.243E-01	*0.277E-01
	300000.	0.116	0.164E-01	0.189E-01	0.196E-01	0.385E-01	0.375E-01
	500000.	0.985E-01	0.158E-01	0.232E-01	0.228E-01	0.468E-01	0.449E-01
S V 3P 5S 329.3 Å C= 0.19E+21	20000.	*0.313	*0.160E-01	*0.181E-02	*0.285E-02		
	50000.	0.198	0.206E-01	*0.835E-02	*0.979E-02		
	100000.	0.150	0.245E-01	*0.150E-01	*0.159E-01		
	150000.	0.130	0.249E-01	0.190E-01	0.188E-01		
	300000.	0.105	0.235E-01	0.251E-01	0.244E-01		
	500000.	0.905E-01	0.226E-01	0.296E-01	0.282E-01		

STARK BROADENING PARAMETER TABLES FOR S V

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS WIDTH(Å)	SHIFT(Å)	PROTONS WIDTH(Å)	SHIFT(Å)	He III WIDTH(Å)	SHIFT(Å)
S V 3P 6S 279.1 Å C= 0.57E+20	20000.	*0.467	*0.537E-01				
	50000.	0.340	0.476E-01				
	100000.	0.278	0.503E-01				
	150000.	0.247	0.493E-01				
	300000.	0.202	0.475E-01				
	500000.	0.177	0.444E-01				
S V 4P 5S 1230.5 Å C= 0.26E+22	20000.	*5.64	*0.189	*0.387E-01	*0.392E-01		
	50000.	3.70	0.248	*0.142	*0.135		
	100000.	2.83	0.315	*0.242	*0.219		
	150000.	2.46	0.324	*0.294	*0.260		
	300000.	2.01	0.300	*0.376	*0.336		
	500000.	1.75	0.293	*0.439	*0.388		
S V 4P 6S 736.1 Å C= 0.40E+21	20000.						
	50000.	*2.67	*0.312				
	100000.	2.17	0.336				
	150000.	1.93	0.332				
	300000.	1.60	0.320				
	500000.	1.40	0.300				
S V 3P 3D 696.6 Å C= 0.38E+22	20000.	0.405	-0.324E-02	0.126E-02	0.575E-04	0.126E-02	0.433E-04
	50000.	0.264	0.602E-03	0.536E-02	0.280E-03	0.963E-02	0.442E-03
	100000.	0.190	0.804E-03	0.104E-01	0.638E-03	0.201E-01	0.118E-02
	150000.	0.158	0.639E-03	0.134E-01	0.965E-03	0.262E-01	0.184E-02
	300000.	0.119	0.983E-03	0.183E-01	0.169E-02	0.363E-01	0.333E-02
	500000.	0.994E-01	0.815E-03	0.203E-01	0.222E-02	0.402E-01	0.445E-02
S V 3P 4D 369.7 Å C= 0.28E+21	20000.	0.284	-0.730E-03	0.247E-02	0.804E-03		
	50000.	0.185	0.420E-02	0.820E-02	0.336E-02		
	100000.	0.139	0.582E-02	0.127E-01	0.578E-02		
	150000.	0.119	0.606E-02	0.153E-01	0.740E-02		
	300000.	0.950E-01	0.576E-02	0.181E-01	0.963E-02	*0.359E-01	*0.185E-01
	500000.	0.821E-01	0.553E-02	0.203E-01	0.112E-01	*0.405E-01	*0.221E-01
S V 3P 5D 291.5 Å C= 0.47E+20	20000.	*0.407	*0.908E-04				
	50000.	*0.305	*0.132E-01				
	100000.	0.246	0.151E-01				
	150000.	0.219	0.155E-01				
	300000.	0.181	0.164E-01	*0.491E-01	*0.345E-01		
	500000.	0.160	0.149E-01	*0.542E-01	*0.395E-01		
S V 3P 6D 264.8 Å C= 0.38E+20	20000.						
	50000.	*0.460	*0.336E-01				
	100000.	*0.398	*0.359E-01				
	150000.	0.366	0.368E-01				
	300000.	0.317	0.369E-01				
	500000.	0.285	0.337E-01				
S V 4P 4D 2080.3 Å C= 0.88E+22	20000.	*12.3	*0.889E-01	*0.131	*0.231E-01		
	50000.	8.14	0.843E-01	*0.393	*0.980E-01		
	100000.	6.14	0.143	*0.577	*0.170		
	150000.	5.31	0.148	*0.658	*0.217		
	300000.	4.27	0.115	0.757	0.284		
	500000.	3.73	0.117	0.831	0.331	*1.65	*0.653
S V 4P 5D 828.5 Å C= 0.38E+21	20000.	*3.75	*0.152E-01				
	50000.	*2.77	*0.987E-01				
	100000.	2.23	0.116				
	150000.	1.98	0.118				
	300000.	1.64	0.121				
	500000.	1.45	0.111	*0.448	*0.318		
S V 4P 6D 644.2 Å C= 0.22E+21	20000.						
	50000.	*2.90	*0.189				
	100000.	*2.49	*0.205				
	150000.	2.28	0.211				
	300000.	1.98	0.211				
	500000.	1.78	0.193				

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS WIDTH(Å)	SHIFT(Å)	PROTONS WIDTH(Å)	SHIFT(Å)	He III WIDTH(Å)	SHIFT(Å)
S V 3D 4P 1268.5 Å C= 0.47E+22	20000.	3.00	-0.336E-01	0.247E-01	0.708E-03	*0.228E-01	*0.533E-03
	50000.	1.95	0.158E-01	0.817E-01	0.343E-02	*0.143	*0.542E-02
	100000.	1.44	0.124E-01	0.126	0.748E-02	*0.242	*0.138E-01
	150000.	1.23	0.142E-01	0.152	0.106E-01	*0.297	*0.202E-01
	300000.	0.969	0.217E-01	0.176	0.161E-01	*0.349	*0.317E-01
	500000.	0.835	0.189E-01	0.191	0.208E-01	*0.381	*0.415E-01
S V 3D 5P 564.3 Å C= 0.55E+21	20000.	*1.08	*0.108E-01	*0.265E-01	*0.256E-02		
	50000.	0.768	0.243E-01	*0.678E-01	*0.103E-01		
	100000.	0.614	0.241E-01	*0.909E-01	*0.173E-01		
	150000.	0.546	0.288E-01	*0.995E-01	*0.221E-01		
	300000.	0.458	0.268E-01	*0.112	*0.282E-01		
	500000.	0.409	0.259E-01	*0.120	*0.329E-01		
S V 4D 5P 1987.3 Å C= 0.68E+22	20000.	*16.6	*0.488E-01	*0.305	*0.243E-01		
	50000.	11.7	0.373E-01	*0.784	*0.101		
	100000.	9.34	0.121	*1.06	*0.173		
	150000.	8.31	0.951E-01	*1.16	*0.222		
	300000.	6.96	0.894E-01	*1.31	*0.289		
	500000.	6.20	0.883E-01	*1.40	*0.336		
S V 3D 4F 679.0 Å C= 0.94E+21	20000.	0.897	-0.186E-01	0.722E-02	-0.107E-02	*0.668E-02	-0.798E-03
	50000.	0.583	0.667E-03	0.240E-01	-0.488E-02	*0.421E-01	-0.759E-02
	100000.	0.433	-0.283E-02	0.370E-01	-0.936E-02	*0.711E-01	-0.170E-01
	150000.	0.370	-0.381E-02	0.448E-01	-0.119E-01	*0.875E-01	-0.223E-01
	300000.	0.294	0.101E-02	0.522E-01	-0.168E-01	*0.104	-0.326E-01
	500000.	0.255	-0.395E-03	0.572E-01	-0.194E-01	*0.114	-0.386E-01
S V 4F 5D 1914.1 Å C= 0.20E+22	20000.	*20.3	*0.162				
	50000.	*15.0	*0.562				
	100000.	12.0	0.669				
	150000.	10.7	0.693				
	300000.	8.88	0.690				
	500000.	7.84	0.637	*2.41	*1.74		
S V 4F 6D 1152.4 Å C= 0.72E+21	20000.						
	50000.	*9.34	*0.625				
	100000.	*8.03	*0.677				
	150000.	7.36	0.700				
	300000.	6.37	0.692				
	500000.	5.73	0.635				
S V 4F 5G 1770.2 Å C= 0.42E+21	20000.	*13.6	-0.215				
	50000.	9.49	0.174				
	100000.	7.43	0.331				
	150000.	6.54	0.417				
	300000.	5.38	0.369				
	500000.	4.72	0.380				
S V 4F 6G 1108.2 Å C= 0.11E+21	20000.						
	50000.	*9.29	*0.153				
	100000.	*7.60	*0.449				
	150000.	6.79	0.530				
	300000.	5.65	0.508				
	500000.	4.95	0.507				
S V 3D 4F 568.3 Å C= 0.48E+21	20000.	0.581	-0.151E-01	0.404E-02	-0.121E-02	*0.385E-02	-0.901E-03
	50000.	0.377	-0.130E-02	0.141E-01	-0.536E-02	*0.249E-01	-0.826E-02
	100000.	0.279	-0.174E-02	0.225E-01	-0.972E-02	*0.433E-01	-0.176E-01
	150000.	0.238	-0.261E-02	0.278E-01	-0.123E-01	*0.545E-01	-0.229E-01
	300000.	0.187	0.290E-03	0.337E-01	-0.165E-01	*0.667E-01	-0.318E-01
	500000.	0.161	-0.626E-03	0.377E-01	-0.192E-01	0.743E-01	-0.381E-01
S V 4F 5D 1748.8 Å C= 0.18E+22	20000.	*16.3	*0.178				
	50000.	*12.0	*0.495				
	100000.	9.70	0.575				
	150000.	8.61	0.596				
	300000.	7.15	0.597	*1.76	*1.23		
	500000.	6.31	0.556	*1.95	*1.40		

STARK BROADENING PARAMETER TABLES FOR S V

PERTURBERS ARE: TRANSITION		T(K)	ELECTRONS WIDTH(Å) SHIFT(Å)	PROTONS WIDTH(Å) SHIFT(Å)	He III WIDTH(Å) SHIFT(Å)			
S V 4F 6D 1070.8 Å C= 0.47E+21		20000. 50000. 100000. 150000. 300000. 500000.	 *8.04 *6.69 6.03 5.11 4.55	 *0.393 *0.434 0.465 0.471 0.422				
PERTURBER DENSITY = 1.E+20cm-3								
S V 3S 3P 786.5 Å C= 0.79E+23		50000. 100000. 150000. 300000. 500000. 1000000.	2.61 1.86 1.53 1.14 0.941 0.755	-0.941E-02 -0.155E-01 -0.149E-01 -0.189E-01 -0.193E-01 -0.183E-01	0.201E-01 0.532E-01 0.762E-01 0.114 0.137 0.156	-0.249E-02 -0.795E-02 -0.128E-01 -0.236E-01 -0.314E-01 -0.427E-01	*0.226E-01 *0.922E-01 *0.144 *0.221 *0.272 *0.311	-0.218E-02 -0.121E-01 -0.223E-01 -0.443E-01 -0.607E-01 -0.851E-01
S V 3S 4P 286.1 Å C= 0.24E+22		50000. 100000. 150000. 300000. 500000. 1000000.	*0.949 0.700 0.595 0.467 0.401 0.336	*0.630E-02 0.459E-02 0.548E-02 0.958E-02 0.800E-02 0.801E-02	*0.263E-01 *0.531E-01 *0.666E-01 *0.801E-01 *0.879E-01 *0.970E-01	*0.100E-02 *0.305E-02 *0.462E-02 *0.754E-02 *0.100E-01 *0.124E-01		
S V 3S 5P 223.3 Å C= 0.85E+21		50000. 100000. 150000. 300000. 500000. 1000000.	 *0.946 *0.842 0.705 0.629 0.547	 *0.277E-01 *0.373E-01 0.363E-01 0.354E-01 0.355E-01				
S V 4S 5P 782.4 Å C= 0.10E+23		50000. 100000. 150000. 300000. 500000. 1000000.	 *13.5 *12.0 10.1 9.00 7.80	 *0.111 *0.159 0.133 0.132 0.135				
S V 3P 4S 518.2 Å C= 0.79E+22		50000. 100000. 150000. 300000. 500000. 1000000.	*2.37 1.74 1.48 1.16 0.985 0.808	*0.802E-01 0.103 0.135 0.144 0.140 0.139	*0.336E-01 *0.877E-01 *0.121 *0.188 *0.232 *0.296	*0.360E-01 *0.883E-01 *0.123 *0.176 *0.217 *0.267		
S V 3P 5S 329.3 Å C= 0.19E+22		50000. 100000. 150000. 300000. 500000. 1000000.	*1.98 *1.50 1.30 1.05 0.903 0.755	*0.773E-01 *0.165 0.186 0.191 0.191 0.179				
S V 3P 6S 279.1 Å C= 0.57E+21		50000. 100000. 150000. 300000. 500000. 1000000.	 *2.35 *1.94 1.71 1.42	 *0.232 *0.295 0.299 0.269				
S V 3P 3D 696.6 Å C= 0.38E+23		50000. 100000. 150000. 300000. 500000. 1000000.	2.64 1.90 1.58 1.19 0.994 0.813	0.396E-02 0.673E-02 0.532E-02 0.914E-02 0.757E-02 0.773E-02	0.428E-01 0.100 0.131 0.182 0.202 0.227	0.169E-02 0.539E-02 0.872E-02 0.162E-01 0.219E-01 0.302E-01	*0.399 *0.452	*0.424E-01 *0.602E-01
S V 3P 4D 369.7 Å C= 0.28E+22		50000. 100000. 150000. 300000. 500000. 1000000.	*1.85 1.39 1.19 0.949 0.820 0.690	*0.120E-01 0.392E-01 0.457E-01 0.475E-01 0.470E-01 0.455E-01	*0.203 *0.232	*0.107 *0.133		

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS WIDTH(Å)	SHIFT(Å)	PROTONS WIDTH(Å)	SHIFT(Å)	He III WIDTH(Å)	SHIFT(Å)
S V 3P 5D 291.5 Å C= 0.47E+21	50000.						
	100000.	*2.36	*0.516E-02				
	150000.	*2.11	*0.406E-01				
	300000.	*1.76	*0.838E-01				
	500000.	1.55	0.844E-01				
1000000.	1.33	0.796E-01					
S V 3P 6D 264.8 Å C= 0.38E+21	50000.						
	100000.						
	150000.						
	300000.	*3.04	*0.196				
	500000.	*2.75	*0.196				
1000000.	*2.40	*0.185					
S V 3D 4P 1268.5 Å C= 0.47E+23	50000.	*19.5	*0.136				
	100000.	14.4	0.109				
	150000.	12.3	0.129				
	300000.	9.69	0.207	*1.74	*0.153		
	500000.	8.35	0.182	*1.91	*0.204		
1000000.	7.03	0.179	*2.09	*0.252			
S V 3D 5P 564.3 Å C= 0.55E+22	50000.						
	100000.	*6.13	*0.182				
	150000.	*5.46	*0.243				
	300000.	4.58	0.236				
	500000.	4.09	0.231				
1000000.	3.57	0.231					
S V 3D 4F 679.0 Å C= 0.94E+22	50000.	5.83	0.476E-01				
	100000.	4.33	-0.308E-02				
	150000.	3.70	-0.184E-01				
	300000.	2.94	0.226E-01	*0.516	-0.156		
	500000.	2.55	0.709E-02	*0.570	-0.187		
1000000.	2.16	0.840E-02	*0.638	-0.232			
S V 3D 4F 568.3 Å C= 0.48E+22	50000.	*3.76	*0.361E-01	*0.104	-0.299E-01		
	100000.	2.79	0.123E-01	*0.211	-0.761E-01		
	150000.	2.37	-0.235E-02	*0.269	-0.103		
	300000.	1.87	0.190E-01	*0.334	-0.151		
	500000.	1.61	0.656E-02	*0.376	-0.184		
1000000.	1.35	0.113E-01	*0.437	-0.227			
PERTURBER DENSITY = 1.E+21cm-3							
S V 3S 3P 786.5 Å C= 0.79E+24	50000.	*0.661E-01	-0.505E-02				
	100000.	*18.6	-0.805E-01	*0.396	-0.451E-01		
	150000.	15.3	-0.984E-01	*0.674	-0.927E-01		
	300000.	11.4	-0.155	*1.10	-0.206		
	500000.	9.41	-0.167	*1.36	-0.286		
1000000.	7.55	-0.163	*1.56	-0.415			
S V 3S 4P 286.1 Å C= 0.24E+23	50000.						
	100000.						
	150000.	*5.90	*0.349E-01				
	300000.	*4.64	*0.811E-01				
	500000.	3.99	0.713E-01				
1000000.	3.34	0.732E-01					
S V 3P 4S 518.2 Å C= 0.79E+23	50000.						
	100000.	*16.9	-0.471				
	150000.	*14.5	*0.235				
	300000.	*11.4	*0.710				
	500000.	9.70	0.852				
1000000.	7.98	0.992					
S V 3P 5S 329.3 Å C= 0.19E+23	50000.						
	100000.						
	150000.						
	300000.	*9.49	*0.537				
	500000.	*8.31	*0.878				
1000000.	7.05	1.02					

STARK BROADENING PARAMETER TABLES FOR S V

PERTURBERS ARE: TRANSITION	T(K)	ELECTRONS WIDTH(Å)	SHIFT(Å)	PROTONS WIDTH(Å)	SHIFT(Å)	He III WIDTH(Å)	SHIFT(Å)
S V 3P 3D 696.6 Å C= 0.38E+24	50000.						
	100000.	*19.0	*0.172E-01				
	150000.	*15.8	*0.157E-01				
	300000.	11.9	0.683E-01				
	500000.	9.94	0.584E-01				
1000000.	8.13	0.639E-01	*2.26		*0.294		
S V 3P 4D 369.7 Å C= 0.28E+23	50000.						
	100000.						
	150000.						
	300000.	*9.27	*0.134				
	500000.	*8.04	*0.214				
1000000.	6.79	0.265					
S V 3D 4F 568.3 Å C= 0.48E+23	50000.						
	100000.						
	150000.	*22.6	*0.656				
	300000.	*18.0	*0.639				
	500000.	15.6	0.407				
1000000.	13.1	0.364					

at half maximum. For each value given in Table 1, the collision volume (V) multiplied by the perturber density (N) is much less than one and the impact approximation is valid (Sahal-Bréchet, 1969ab). Values for $NV > 0.5$ are not given and values for $0.1 < NV \leq 0.5$ are denoted by an asterisk. Stark broadening parameters for densities lower than tabulated, are linear with perturber density. When the impact approximation is not valid, the ion broadening contribution may be estimated by using quasistatic approach (Sahal-Bréchet 1991 or Griem 1974). In the region between where neither of these two approximations is valid, a unified type theory should be used. For example in Barnard et al. (1974), simple analytical formulas for such a case are given. The accuracy of the results obtained decreases when broadening by ion interactions becomes important.

The discussion of obtained results will be appear in Dimitrijević and Sahal-Bréchet, 1997.

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REFERENCES

- Barnard, A.J., Cooper, J., Smith, E.W., 1974, *J. Quant. Spectrosc. Radiative Transfer* 14, 1025.
 Dimitrijević, M. S., and Sahal-Bréchet, S.: 1984, *J. Quant Spectrosc. Radiative Transfer* 31, 301.
 Dimitrijević M.S., Sahal-Bréchet, S.: 1995, *Physica Scripta*, 52, 41.
 Dimitrijević, M. S., and Sahal-Bréchet, S.: 1997, *Astron. Astrophys. Suppl. Series*, submitted.
 Dimitrijević, M.S., Sahal-Bréchet, S., Bommier, V.: 1991, *Astron. Astrophys. Suppl. Series* 89, 581.
 Fleurier, C., Sahal-Bréchet, S., Chapelle, J.: 1977, *J. Quant. Spectrosc. Radiative Transfer*, 17, 595.
 Griem, H. R.: 1974, *Spectral Line Broadening by Plasmas*, Academic Press, New York.
 Martin, W.C., Zalubas, R., Musgrove, A.: 1990, *J. Phys. Chem. Ref. Data*, 10, 821.
 Rauch, T.: 1996, Private communication.
 Sahal-Bréchet, S.: 1969a, *Astron. Astrophys.* 1, 91.
 Sahal-Bréchet, S.: 1969b, *Astron. Astrophys.* 2, 322.
 Sahal-Bréchet, S.: 1974, *Astron. Astrophys.* 35, 321.
 Sahal-Bréchet, S.: 1991, *Astron. Astrophys.* 245, 322.

ТАБЕЛЕ ПАРАМЕТАРА ШТАРКОВОГ ШИРЕЊА СПЕКТРАЛНИХ ЛИНИЈА S V

M. S. Димитријевић¹ и S. Sahal-Bréchet²

¹ *Астрономска опсерваторија, Волгина 7, 11000 Београд, Југославија*

² *Laboratoire "Astrophysique, Atomes et Molécules"
 Département Atomes et Molécules en Astrophysique
 Unité associée au C.N.R.S. No 812
 Observatoire de Paris-Meudon, 92190 Meudon, France*

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 Претходно саопштење

Користећи семикласичан прилаз, израчуна-
 те су ширине и помераји спектралних линија, про-
 узроковани сударима са електронима, протонима

и двоструко наелектрисаним јонима хелијума, за
 34 мултиплета S V. Резултати су дати у функцији
 температуре и концентрације пертурбера.